

WHAT IS CLAIMED IS:

1. A gear state diagnostic method using frequency demodulation comprising:
 (a) detecting a voltage value that is linked to changes in rotational speed of a gear, the voltage value being output by a pulse generator;
 5 (b) performing frequency modulation of the voltage value by monitoring means;
 (c) acquiring the rotational speed of the gear by performing frequency demodulation of the frequency modulated voltage value; and
 (d) monitoring the demodulated frequency and tracking changes in rotation of
 10 the gear to determine whether there are errors in the gear.

2. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a square wave.

15 3. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a sawtooth wave.

4. The method of claim 1 wherein in step (d), it is determined that there are errors in the gear if a trace of changes in rotation of the gear is non-uniform.
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5. The method of claim 1, wherein said step (c) employs a sampling method.

6. A gear state diagnostic method, comprising:
 generating a signal corresponding to a rotational gear speed;
 25 modulating said signal;
 demodulating said signal to acquire the gear rotational speed;
 monitoring the demodulated signal;
 tracking changes in gear rotation based on said monitored signal; and
 determining whether errors are present in the gear based on said tracked
 30 changes.

7. The diagnostic method according to claim 6, further comprising sampling the modulated signal and wherein said demodulating is a demodulating of the sampled signal.

5 8. The diagnostic method according to claim 6, wherein said determining step comprises determining whether the changes in gear rotation are non-uniform.

9. The diagnostic method according to claim 6, wherein said signal is a voltage value corresponding to rotational gear speed.

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10. The diagnostic method according to claim 9, wherein said voltage value is generated by a pulse generator.

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11. The diagnostic method according to claim 9, wherein said modulating step is a frequency modulation and said demodulating step is a frequency demodulation.